CLAIMS

1. A system for deriving a user model from a plurality of event records relating to events, each event record comprising data relating to attributes of an event, the system comprising:

identifying means for identifying a plurality of sequences of event records from said plurality of event records, each sequence containing two or more event records;

clustering means for determining a plurality of sequence clusters from said plurality of sequences, each sequence cluster comprising a plurality of related sequences;

rule deriving means for analysing the sequences in a cluster and deriving one or more rules relating to the sequences of that cluster; and

user modelling means for storing rules derived in relation to separate clusters and for providing a user model comprising rules derived in relation to a plurality of clusters.

2. A system according to claim 1, wherein each event record comprises data relating to one or more of the following attributes of an event: the type of the event; the location of the event; the duration of the event; the date of the event; and the time-of-day of the event.

3. A system according to claim 1 or 2, wherein each event record comprises event-time data relating to the date and/or time-of-day of an event, and event-type data relating to the type of event.

4. A system according to claim 1, 2 or 3, wherein a sequence of event records contains event records relating to two events.

5. A system according to any of the preceding claims, further comprising means for evaluating a measure of the distance between events according to a predetermined event-space distance function.

6. A system according to claim 5, wherein said identifying means identifies sequences with reference to the value of the distance measure between events.

7. A system according to any of the preceding claims, further comprising:

means for generating, in relation to each cluster, artificial sequences, each artificial sequence containing two or more event records, said artificial sequences being different to the sequences of that cluster that have been identified from said event records; and

means for deriving a measure of sequence probability for each artificial sequence indicative of the likelihood that said artificial sequence contains event records relating to two or more related events.

8. A system according to claim 7, wherein said measure of sequence probability of an artificial sequence is derived with reference to a measure of the distance between the events, evaluated according to a predetermined event-space distance function

9. A system according to claim 7 or 8, further comprising means for designating an artificial sequence as a positive or a negative example of the user's behaviour with reference to said measure of sequence probability, and wherein the rule deriving means takes account of negative examples within a cluster when deriving rules relating to the sequences of that cluster.

10. A system according to any of the preceding claims, further comprising means for analysing said sequence clusters and determining therefrom a probability distribution in respect of the types of sequences identified by said identifying means.

11. A system according to any of the preceding claims, wherein said event records relate to activities of an individual user.

12. A method of deriving a user model from a plurality of event records relating to events, each event record comprising data relating to attributes of an event, the method comprising:

identifying a plurality of sequences of event records from said plurality of event records, each sequence containing a plurality of event records;

determining a plurality of sequence clusters from said plurality of sequences, each sequence cluster comprising a plurality of related sequences;

analysing the sequences in a cluster and deriving one or more rules relating to the sequences of that cluster; and

providing a user model based on rules derived in relation to a plurality of clusters.

13. A method according to claim 12, wherein each event record comprises data relating to one or more of the following attributes of an event: the type of the event; the location of the event; the duration of the event; the date of the event; and the time-of-day of the event.

14. A method according to claim 12 or 13, wherein each event record comprises event-time data relating to the date and/or time-of-day of an event, and event-type data relating to the type of event.

15. A method according to claim 12, 13 or 14, wherein a sequence of event records contains event records relating to two events.

16. A method according to any of claims 12 to 15, further comprising a step of evaluating a measure of the distance between events according to a predetermined event-space distance function.

17. A method according to claim 16, wherein said identifying step comprises identifying sequences with reference to the value of the distance measure between events.

18. A method according to any of claims 12 to 17, further comprising:

a step of generating, in relation to each cluster, artificial sequences, each artificial sequence containing two or more event records, said artificial sequences being different to the sequences of that cluster that have been identified from said event records; and

a step of deriving a measure of sequence probability for each artificial sequence indicative of the likelihood that said artificial sequence contains event records relating to two or more related events.

19. A method according to claim 18, wherein said measure of sequence probability of an artificial sequence is derived with reference to a measure of the distance between the events, evaluated according to a predetermined event-space distance function

20. A method according to claim 18 or 19, further comprising a step of designating an artificial sequence as a positive or a negative example of the user's behaviour with

reference to said measure of sequence probability, and wherein the rule deriving step takes account of negative examples within a cluster when deriving rules relating to the sequences of that cluster.

21. A method according to any of claims 12 to 20, further comprising a step of analysing said sequence clusters and determining therefrom a probability distribution in respect of the types of sequences identified by said identifying means.

22. A method according to any of claims 12 to 21, wherein said event records relate to activities of an individual user.

23. A system for generating potential event records relating to potential events which may follow or precede known events having known event records, each event record comprising data relating to attributes of an event, from a user model comprising rules relating to sequences of event records, the system comprising:

means for identifying from said user model rules relating to sequences which include a known event record;

means for generating from said rules event records relating to events which may follow or precede the event to which said known event record relates;

means for identifying from said rules a measure of probability in relation to each generated event record;

means for selecting one or more generated event records having the highest or relatively high measures of probability as potential event records each relating to a potential event to follow or precede said known event.

24. A system according to claim 23, further comprising means for providing said selected event records as suggestions to a user.

25. A system according to claim 23 or 24, further comprising means for incorporating said selected event records in a user's diary.

26. A system according to any of claims 23 to 25, wherein said known event records relate to activities of an individual user.

27. A system for determining a potential sequential order for a plurality of known events, each known event having a known event record, each event record comprising data relating to attributes of the event, from a user model comprising rules relating to sequences of event records, the system comprising:

means for designating each of said known events as a potential first or last event in a series;

means for identifying, in relation to each potential first or last event, rules from said user model, said rules relating to sequences which include the event record relating to said potential first or last event;

means for identifying from said rules event records relating to other known events which may potentially follow or precede the potential first or last event;

means for identifying from said rules measures of probability in relation to a plurality of series, each series comprising a potential first or last event and a known event which may potentially follow or precede said potential first or last event;

means for selecting one or more of said series having the highest or relatively high measures of probability as potential sequential orders for a plurality of known events.

28. A system according to claim 27, further comprising means for providing said selected sequential orders as suggestions to a user.

29. A system according to claim 27 or 28, further comprising means for incorporating said selected sequential orders in a user's diary.

30. A system according to any of claims 27 to 29, wherein said known event records relate to activities of an individual user.

31. A system according to any of claims 23 to 30, wherein said user model is a user model derived by a system according to any of claims 1 to 11, or is derived using a method according to any of claims 12 to 22.

32. A method for generating potential event records relating to potential events which may follow or precede known events having known event records, each event record comprising data relating to attributes of an event, from a user model comprising rules relating to sequences of event records, the method comprising the steps of:

identifying from said user model rules relating to sequences which include a known event record;

generating from said rules event records relating to events which may follow or precede the event to which said known event record relates;

identifying from said rules a measure of probability in relation to each generated event record;

selecting one or more generated event records having the highest or relatively high measures of probability as potential event records each relating to a potential event to follow or precede said known event.

33. A method according to claim 32, further comprising a step of providing said selected event records as suggestions to a user.

34. A method according to claim 32 or 33, further comprising a step of incorporating said selected event records in a user's diary.

35. A method according to any of claims 32 to 34, wherein said known event records relate to activities of an individual user.

36. A method for determining a potential sequential order for a plurality of known events, each known event having a known event record, each event record comprising data relating to attributes of the event, from a user model comprising rules relating to sequences of event records, the method comprising the steps of:

designating each of said known events as a potential first or last event in a series;

identifying, in relation to each potential first or last event, rules from said user model, said rules relating to sequences which include the event record relating to said potential first or last event;

identifying from said rules event records relating to other known events which may potentially follow or precede the potential first or last event to form a series of events;

identifying from said rules measures of probability in relation to a plurality of series, each series comprising a potential first or last event and a known event which may potentially follow or precede said potential first or last event;

selecting one or more of said series having the highest or relatively high measures of probability as potential sequential orders for a plurality of known events.

37. A method according to claim 36, further comprising a step of providing said selected sequential orders as suggestions to a user.

38. A method according to claim 36 or 37, further comprising a step of incorporating said selected sequential orders in a user's diary.

39. A method according to any of claims 36 to 38, wherein said known event records relate to activities of an individual user.

40. A method according to any of claims 32 to 39, wherein said user model is a user model derived by a system according to any of claims 1 to 11 or is derived using a method according to any of claims 12 to 22.